

FROST ASSOCIATES

US EPA RECORDS CENTER REGION 5



464905

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February 17, 1995

To: PRC Environmental Management Inc.
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ENTERED

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Tel: (203) 767-1254
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Sub: Jackson County Landfill
Jackson, OH

CERCLIS:

Job: 030-0035930

Site Longitude: 82-39-58 82.666107
Site Latitude : 39-04-45 39.079170

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-1A files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, P.O. Box 495, Essex, Conn. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ring are retained. All Block Group boundary lines matching the Block Group numbers are then extracted from the respective county files to obtain all sides of the included Block Groups. Boundary records are then sorted in adjacent side order to determine the shape and area of each Block Group polygon.

A method to solve for the area of a polygon is to take one-half the sum of the products obtained by multiplying each X-coordinate by the difference between the adjacent Y-coordinates. For a polygon with coordinates at adjacent angles A, B, C, D, and E. The formula can be expressed:

$$\text{Area} = 1/2\{X_a(Y_e - Y_b) + X_b(Y_a - Y_c) + X_c(Y_b - Y_d) + X_d(Y_c - Y_e) + X_e(Y_d - Y_a)\}$$

For each ring, the selected Block Groups will be inside, outside, or intersected by the ring. When a polygon is intersected, the partial Block Group area within that ring is calculated using the method described below.

When a ring intersects a Block Group, the intersect points are solved and plotted at the points where the ring enters and exits the shape. The chord line, a line within the circle connecting the intersect points is determined. This chord line is used to calculate the segment area, the half moon shape between the chord line and the ring, and the sub-polygon created by the chord line and the Block Group boundaries that lie outside the ring.

The segment area is subtracted from the sub-polygon area to determine the area of the sub-polygon outside the ring. The area outside the ring is then subtracted from the area of the entire polygon to arrive at the inside area. This inside area is then divided by the tract's total area to determine the percentage of area within the ring. This process is repeated for each block group that is intersected by one of the rings. The total area, partial area, and percentage of partial area of those block groups within, or partially within a ring, are held in memory for the report.

On occasion, the algorithm described above is unable to determine the area of the partial area. Within the report program is a "Paint" routine which allows an enclosed shape to be highlighted. Another routine calculates the percentage of highlighted screen pixels to the pixels within the polygon. A manual entry is allowed. Both the "paint" method and manual entry method override the calculated method.

CENTRACTS lists, starting on page 4, all Block Groups in State, County, Census Tract, and Block Group ID order that lie within, or partially within, the maximum ring. Each Block Group is identified by a City or Town name and by the Block Group's State, County, Tract and Block Group ID number. Following is the Block Group's 1990 population and house count extracted from the Census Bureau's 1990 STF-1A files.

The next four columns display water source data from the 1990 STF-3A files. The first column is "Units with Public system or private company source of water", followed by "Units with individual well, Drilled, source of water"; "Units with individual well, Dug, source of water" and "Units with Other source of water".

For each ring, CENTRACTS then shows the Block Groups that are within that ring, the Block Group's total area in square miles, the partial area of the Block Group within that ring, and the partial percentage within the ring. The areas of the included Block Group and the partial areas are then totaled.

The last section tallies the demographic data within each ring. The percentage of area for each Block Group is multiplied times the census data for that Block Group and totaled for all Block Group's within the ring. Ring totals are then determined by subtracting the three mile data from the four mile, the two mile from the three mile, one from the two, etc... Population on private wells is calculated using the formula: $((\text{Drilled} + \text{Dug Wells}) / \text{Households}) * \text{Population}$

: Jackson County Landfill
Jackson, OH

No.	City	Block Group ID	Blk Grp People	House Holds	Public Water	Drilled Wells	Dug Wells	Other
1	Wellston	39079 9572	6 494	216	146	24	27	0
2	Wellston	39079 9573	2 1359	560	445	30	43	23
3	Wellston	39079 9573	3 1129	453	330	18	62	34
4	Liberty	39079 9574	1 1106	462	6	68	315	71
5	Liberty	39079 9574	2 1236	475	120	60	187	86
6	Liberty	39079 9574	3 1118	414	324	16	89	17
7	Liberty	39079 9574	4 1013	375	104	77	135	56
8	Lick	39079 9575	1 728	356	324	0	6	0
9	Lick	39079 9575	2 789	381	379	0	0	0
10	Lick	39079 9575	3 917	406	391	0	0	0
11	Lick	39079 9575	4 916	429	406	0	8	7
12	Lick	39079 9575	5 990	422	412	0	0	8
13	Lick	39079 9575	6 1198	527	532	0	0	0
14	Liberty	39079 9576	1 1467	588	506	27	65	0
15	Liberty	39079 9576	2 816	325	311	5	0	6
16	Liberty	39079 9576	3 624	279	275	0	0	0
17	Madison	39079 9577	2 478	185	171	5	0	5
18	Madison	39079 9577	3 989	339	254	8	66	13
19	Franklin	39079 9578	1 740	311	132	61	79	39
=====								
Totals:			18107	7503	5568	399	1082	365

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Jackson, OH

City	Census Tract ID		Tract People	House Count	Public Water	Drilled Wells	Dug Wells	Other Wells
Franklin	39079 9578	1	740	311	132	61	79	39
	Sub Totals:		740	311	132	61	79	39
Liberty	39079 9574	3	1118	414	324	16	89	17
Liberty	39079 9574	4	1013	375	104	77	135	56
Liberty	39079 9574	1	1106	462	6	68	315	71
Liberty	39079 9574	2	1236	475	120	60	187	86
Liberty	39079 9576	1	1467	588	506	27	65	0
Liberty	39079 9576	2	816	325	311	5	0	6
Liberty	39079 9576	3	624	279	275	0	0	0
	Sub Totals:		7380	2918	1646	253	791	236
Lick	39079 9575	2	789	381	379	0	0	0
Lick	39079 9575	4	916	429	406	0	8	7
Lick	39079 9575	5	990	422	412	0	0	8
Lick	39079 9575	1	728	356	324	0	6	0
Lick	39079 9575	6	1198	527	532	0	0	0
Lick	39079 9575	3	917	406	391	0	0	0
	Sub Totals:		5538	2521	2444	0	14	15
Madison	39079 9577	2	478	185	171	5	0	5
Madison	39079 9577	3	989	339	254	8	66	13
	Sub Totals:		1467	524	425	13	66	18
Wellston	39079 9573	2	1359	560	445	30	43	23
Wellston	39079 9573	3	1129	453	330	18	62	34
Wellston	39079 9572	6	494	216	146	24	27	0
	Sub Totals:		2982	1229	921	72	132	57

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For Radius of 4.5 Mi., Circle Area = 63.617251

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
1	Wellston	39079 95726	5.837864	0.244985	4.20
2	Wellston	39079 95732	7.990376	0.780109	9.76
3	Wellston	39079 95733	7.555848	6.463712	85.55
4	Liberty	39079 95741	35.602001	9.670765	27.16
5	Liberty	39079 95742	38.244831	10.573393	27.65
6	Franklin	39079 95781	23.855919	0.645262	2.70
7	Liberty	39079 95744	36.124893	0.074352	0.21
8	Lick	39079 95751	0.368625	0.368625	100.00
9	Lick	39079 95752	0.148918	0.148918	100.00
10	Lick	39079 95753	0.680144	0.680144	100.00
11	Lick	39079 95754	5.805145	5.805145	100.00
12	Lick	39079 95755	4.165330	4.162924	99.94
13	Lick	39079 95756	0.929337	0.929337	100.00
14	Liberty	39079 95761	7.664527	7.183920	93.73
15	Liberty	39079 95762	1.137185	1.137185	100.00
16	Liberty	39079 95763	2.050744	2.050744	100.00
17	Madison	39079 95772	12.832084	0.836253	6.52
18	Madison	39079 95773	32.359791	1.102830	3.41
19	Liberty	39079 95743	27.498833	10.758651	39.12
====			====	====	====
Totals:			250.852386	63.617252	

For Radius of 3.5 Mi., Circle Area = 38.484510

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
2	Wellston	39079 95732	7.990376	0.015407	0.19
3	Wellston	39079 95733	7.555848	4.301271	56.93
4	Liberty	39079 95741	35.602001	5.076286	14.26
5	Liberty	39079 95742	38.244831	4.517250	11.81
8	Lick	39079 95751	0.368625	0.368625	100.00
9	Lick	39079 95752	0.148918	0.148918	100.00
10	Lick	39079 95753	0.680144	0.680144	100.00
11	Lick	39079 95754	5.805145	4.812338	82.90
12	Lick	39079 95755	4.165330	1.707512	40.99
13	Lick	39079 95756	0.929337	0.466664	50.21
14	Liberty	39079 95761	7.664527	4.511460	58.86
15	Liberty	39079 95762	1.137185	1.137185	100.00
16	Liberty	39079 95763	2.050744	2.050744	100.00
18	Madison	39079 95773	32.359791	0.010618	0.03
19	Liberty	39079 95743	27.498833	8.680086	31.57
====			====	====	====
Totals:			172.201630	38.484512	

For Radius of 2.5 Mi., Circle Area = 19.634954

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
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3 Wellston	39079 95733	7.555848	2.254940	29.84
4 Liberty	39079 95741	35.602001	2.177957	6.12
5 Liberty	39079 95742	38.244831	0.426451	1.12
8 Lick	39079 95751	0.368625	0.154344	41.87
9 Lick	39079 95752	0.148918	0.132144	88.74
10 Lick	39079 95753	0.680144	0.680144	100.00
11 Lick	39079 95754	5.805145	2.217168	38.19
12 Lick	39079 95755	4.165330	0.052531	1.26
14 Liberty	39079 95761	7.664527	0.985970	12.86
15 Liberty	39079 95762	1.137185	1.137185	100.00
16 Liberty	39079 95763	2.050744	2.050744	100.00
19 Liberty	39079 95743	27.498833	7.365376	26.78
=====				
Totals:		130.922119	19.634954	

For Radius of 1.5 Mi., Circle Area = 7.068583

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
3 Wellston		39079 95733	7.555848	0.632145	8.37
4 Liberty		39079 95741	35.602001	0.461511	1.30
10 Lick		39079 95753	0.680144	0.099730	14.66
11 Lick		39079 95754	5.805145	0.121061	2.09
15 Liberty		39079 95762	1.137185	0.308955	27.17
16 Liberty		39079 95763	2.050744	1.750878	85.38
19 Liberty		39079 95743	27.498833	3.694303	13.43
=====					
Totals:			80.329895	7.068583	

For Radius of 1 Mi., Circle Area = 3.141593

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
3 Wellston		39079 95733	7.555848	0.140288	1.86
4 Liberty		39079 95741	35.602001	0.040199	0.11
15 Liberty		39079 95762	1.137185	0.000545	0.05
16 Liberty		39079 95763	2.050744	1.035510	50.49
19 Liberty		39079 95743	27.498833	1.925050	7.00
=====					
Totals:			73.844604	3.141593	

For Radius of .5 Mi., Circle Area = 0.785398

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
16 Liberty		39079 95763	2.050744	0.438434	21.38
19 Liberty		39079 95743	27.498833	0.346964	1.26
=====					
Totals:			29.549576	0.785398	

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===== Site Data =====

Population: 10638.17
Households: 4578.73
Drilled Wells: 93.37
Dug Wells: 310.04
Other Water Sources: 103.98

===== Partial (RING) data =====

---- Within Ring: 4.5 Mile(s) and 3.5 Mile(s) ----

Population: 2831.69
Households: 1180.64
Drilled Wells: 40.33
Dug Wells: 128.66
Other Wells: 43.85

** Population On Private Wells: 405.31

---- Within Ring: 3.5 Mile(s) and 2.5 Mile(s) ----

Population: 3175.66
Households: 1376.50
Drilled Wells: 30.07
Dug Wells: 103.76
Other Wells: 31.36

** Population On Private Wells: 308.76

---- Within Ring: 2.5 Mile(s) and 1.5 Mile(s) ----

Population: 3463.82
Households: 1527.11
Drilled Wells: 17.06
Dug Wells: 56.23
Other Wells: 20.95

** Population On Private Wells: 166.25

---- Within Ring: 1.5 Mile(s) and 1 Mile(s) ----

Population: 751.05
Households: 315.54
Drilled Wells: 4.36
Dug Wells: 13.66
Other Wells: 5.92

** Population On Private Wells: 42.89

1-mile 1,167

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---- Within Ring: 1 Mile(s) and .5 Mile(s) ----

Population:	268.44
Households:	114.08
Drilled Wells:	1.33
Dug Wells:	6.61
Other Wells:	1.69

** Population On Private Wells: 18.70

---- Within Ring: .5 Mile(s) and 0 Mile(s) ----

Population:	147.51
Households:	64.87
Drilled Wells:	0.20
Dug Wells:	1.12
Other Wells:	0.21

** Population On Private Wells: 3.01

** Total Population On Private Wells: 944.92